AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-5. (Canceled).

6. (Currently amended) A method of determining if a positionally-addressable biopolymer array has a synthesis defect, said method comprising the following steps in the order stated:

a) contacting a positionally-addressable biopolymer array with a sample, wherein said positionally addressable biopolymer array comprises a substrate to which is attached a plurality of different biopolymer probes, said different biopolymer probes being situated at different positions on said substrate and being the product of a step-by-step synthesis of said different biopolymer probes on said substrate, said plurality of different biopolymer probes comprising a plurality of quality control probes, each quality control probe in said plurality of quality control probes comprising (i) the same predetermined binding sequence or (ii) a different predetermined binding sequence with the same binding specificity, the synthesis of said predetermined binding sequence in each said quality control probe having been initiated during said step-by-step synthesis at different cycles of synthesis, wherein ~~each~~ at least some of said quality control probes ~~optionally~~ further ~~comprises~~ comprise a first sequence contiguous with said predetermined binding sequence, wherein at least some of said quality control probes differ from other of said quality control probes in the length of said first sequence, and wherein said first sequence is a sequence of up to ~~number 0 to~~ N monomers, where N is a whole number equal to or greater than 1, and wherein said sample comprises a binding partner that binds said predetermined binding sequence;

b) detecting or measuring binding between (1) two or more quality control probes of said plurality of quality control probes that differ in the number of said monomers; and (2) said binding partner in the sample; and

c) comparing binding of said two or more quality control probes of said plurality of quality control probes; wherein if said binding is similar, the absence of a synthesis defect between said different cycles of synthesis used to synthesize said two or more quality control probes is indicated.

7. (Canceled).

8. (Previously presented) The method of claim 6 wherein said comparing comprises determining the binding ratio of two quality control probes of said two or more quality control probes, wherein said binding ratio is the amount of binding of a first quality control probe of said two quality control probes with said binding partner, divided by the amount of binding of a second quality control probe of said two quality control probes with said binding partner, and wherein said binding ratio being between 0.5 and 2.0 indicates the absence of said synthesis defect.

9. (Previously presented) The method of claim 6 further comprising before step (a) a step of synthesizing said array.

10. (Previously presented) The method of claim 6 wherein said sample comprises (A) total cellular RNA or mRNA from one or more cells or a plurality of nucleic acids derived therefrom, and (B) said binding partner, wherein said binding partner is not expressed by said one or more cells.

11-36. (Canceled).

37. (Previously presented) The method of claim 6, wherein said synthesis defect is a nozzle failure.

38-39. (Canceled).

40. (Previously presented) A method of detecting a nozzle failure using a positionally addressable array, said method comprising the following steps in the order stated:

a) contacting a positionally addressable array with a sample, wherein said positionally addressable array comprises a substrate to which is attached a plurality of different biopolymer probes, said different biopolymer probes being situated at different positions on said substrate and being the product of a step-by-step synthesis of said different biopolymer probes on said substrate, said plurality of different biopolymer probes comprising a plurality of quality control probes, each quality control probe in said plurality of quality

control probes comprising (i) the same predetermined binding sequence or (ii) a different predetermined binding sequence with the same binding specificity, the synthesis of said predetermined binding sequence in each said quality control probe having been initiated during said step-by-step synthesis at different cycles of synthesis, wherein said sample comprises a binding partner that binds said predetermined binding sequence, wherein at least a portion of said plurality of quality control probes is arranged in a periodicity of P, wherein said periodicity of P is equal to the number of nozzles in an inkjet printhead, and wherein said array is synthesized by step-by-step synthesis using said inkjet printhead with P nozzles, wherein P is a whole number equal to or greater than 1;

b) detecting or measuring binding between two or more quality control probes of said plurality of quality control probes that are arranged in said periodicity of P and said binding partner in the sample; and

c) comparing binding of said two or more quality control probes of said plurality of quality control probes in said periodicity of P, wherein if said binding is similar, the absence of a nozzle defect is indicated.

41. (Canceled)

42. (Previously presented) The method of claim 40 further comprising before step (a) a step of synthesizing said array.

43. (Previously presented) The method of claim 40 wherein said sample comprises (A)total cellular RNA or mRNA from one or more cells or a plurality of nucleic acids derived therefrom, and (B) said binding partner, wherein said binding partner is not expressed by said one or more cells.

44-45. (Canceled).

46. (Previously presented) The method of claim 40 wherein P equals 20.

47. (Previously presented) A method of determining if a positionally-addressable biopolymer array has a synthesis defect, said method comprising the following steps in the order stated:

a) contacting a positionally-addressable biopolymer array with a sample, wherein said positionally addressable biopolymer array comprises a substrate to which is attached a plurality of different biopolymer probes, said different biopolymer probes being situated at different positions on said substrate and being the product of a step-by-step synthesis of said different biopolymer probes on said substrate, said plurality of different biopolymer probes comprising a plurality of quality control probes, wherein the sequence of each quality control probe in said plurality of quality control probes consists of (i) the same predetermined binding sequence or (ii) a different predetermined binding sequence with the same binding specificity, the synthesis of said predetermined binding sequence in each said quality control probe having been initiated during said step-by-step synthesis at different cycles of synthesis of staggered start, wherein said respective different cycles of synthesis of staggered start are initiated at every progressive synthesis cycle during synthesis of the array, and wherein said sample comprises a binding partner that binds said predetermined binding sequence;

b) detecting or measuring binding between two or more quality control probes of said plurality of quality control probes and said binding partner in the sample; and

c) comparing binding of said two or more quality control probes of said plurality of quality control probes, wherein if said binding is similar, the absence of a synthesis defect between said different cycles of synthesis of said array is indicated.

48. (Previously presented) The method of claim 47 further comprising before step (a) a step of synthesizing said array.

49. (Previously presented) The method of claim 47 wherein said sample comprises (A) total cellular RNA or mRNA from one or more cells or a plurality of nucleic acids derived therefrom, and (B) said binding partner, wherein said binding partner is not expressed by said one or more cells.

50. (Previously presented) The method of claim 47 wherein said synthesis defect is a nozzle failure.

51-52. (Canceled).

53. (Previously presented) The method of claim 47 wherein said comparing comprises determining the binding ratio of two quality control probes of said two or more quality

control probes, wherein said binding ratio is the amount of said binding partner bound to a first quality control probe of said two quality control probes, divided by the amount of said binding partner bound to a second quality control probe of said two quality control probes, and wherein said binding ratio being between 0.5 and 2.0 indicates the absence of said synthesis defect.

54. (Previously presented) A method of detecting a nozzle failure using a positionally addressable array, said method comprising the following steps in the order stated:

a) contacting a positionally addressable array with a sample, wherein said positionally addressable array comprises a substrate to which is attached a plurality of different biopolymer probes, said different biopolymer probes being situated at different positions on said substrate and being the product of a step-by-step synthesis of said different biopolymer probes on said substrate, said plurality of different biopolymer probes comprising a plurality of quality control probes, wherein the sequence of each quality control probe in said plurality of quality control probes consists of (i) the same predetermined binding sequence or (ii) a different predetermined binding sequence with the same binding specificity, the synthesis of said predetermined binding sequence in each said quality control probe having been initiated during said step-by-step synthesis at different cycles of synthesis of staggered start, wherein said respective different cycles of synthesis of staggered start are initiated at every progressive synthesis cycle during synthesis of the array, and wherein said sample comprises a binding partner that binds said predetermined binding sequence, wherein at least a portion of said plurality of quality control probes is arranged in a periodicity of P, wherein said periodicity of P is equal to the number of nozzles in an inkjet printhead, and wherein said array is synthesized by step-by-step synthesis using said inkjet printhead with P nozzles, wherein P is a whole number equal to or greater than 1;

b) detecting or measuring binding between two or more quality control probes of said plurality of quality control probes that are arranged in said periodicity of P and said binding partner in the sample; and

c) comparing binding of said two or more quality control probes of said plurality of quality control probes arranged in said periodicity of P, wherein if said binding is similar, the absence of a nozzle defect is indicated.

55. (Previously presented) The method of claim 54 wherein P equals 20.

56. (Currently amended) A method of detecting a nozzle failure using a positionally addressable array, said method comprising the following steps in the order stated:

a) contacting a positionally-addressable biopolymer array with a sample, wherein said positionally addressable biopolymer array comprises a substrate to which is attached a plurality of different biopolymer probes, said different biopolymer probes being situated at different positions on said substrate and being the product of a step-by-step synthesis of said different biopolymer probes on said substrate, said plurality of different biopolymer probes comprising a plurality of quality control probes, each quality control probe in said plurality of quality control probes comprising (i) the same predetermined binding sequence or (ii) a different predetermined binding sequence with the same binding specificity, the synthesis of said predetermined binding sequence in each said quality control probe having been initiated during said step-by-step synthesis at different cycles of synthesis, wherein

~~each~~ at least some of said plurality of quality control probes ~~optionally~~ further ~~optionally comprises~~ comprise a first sequence contiguous with said predetermined binding sequence,

at least some of said plurality of quality control probes differ from other of said plurality of quality control probes in the length of said first sequence,

said first sequence is a sequence of up to ~~number 0 to~~ N monomers, where N is a whole number equal to or greater than 1,

at least a portion of said plurality of quality control probes is arranged in a periodicity of P, wherein said periodicity of P is equal to the number of nozzles in an inkjet printhead,

said array is synthesized by step-by-step synthesis using said inkjet printhead with P nozzles,

P is a whole number equal to or greater than 1, and

wherein said sample comprises a binding partner that binds said predetermined binding sequence;

b) detecting or measuring binding between (1) two or more quality control probes of said plurality of quality control probes that are arranged in said periodicity of P and that differ in the number of said monomers; and (2) said binding partner in the sample; and

c) comparing binding of said two or more quality control probes of said plurality of quality control probes arranged in said periodicity of P, wherein if said binding is similar, the absence of a nozzle defect is indicated.

57. (Previously presented) The method of claim 56 wherein P equals 20.